

What is claimed is:

5-3  
A1

1. A vehicle control system comprising a plurality of control devices which forms a plurality of subsystems connected to respective controlled objects and a cooperative control device which cooperatively operates said plurality of control devices through a communication line, wherein

5 each of said plurality of control devices comprises an input/output control device for conducting input and output processing for the signals sent and received between said cooperative control devices and said controlled objects; and

said cooperative control device comprises a control calculation device for calculating control signals which control operations of said plurality of control devices and said controlled objects based on the received signals that have been received from said plurality of control devices.

3-3  
B1

2. A vehicle control system according to claim 1 wherein

said control calculation device of said cooperative control device calculates controlled physical values to be attained by operations of said plurality of control devices and said controlled objects as control signals which control the operation of said plurality of control devices and said controlled objects; and

5 said input/output control devices of said control system convert said controlled physical values which have been received from said cooperative control device to operation command values that indicate directly the operation of said control devices and said controlled objects.

10 3-3  
A2

3. A vehicle control system according to either claim 1 or claim 1, wherein

said plurality of control devices provides an autonomous control device which controls the operations of said controlled objects independently from said cooperative control device during the occurrence of an abnormality between said communication systems and said cooperative control devices or said cooperative control device.

4. A vehicle control system comprising a plurality of control devices which forms a plurality of subsystems connected to respective controlled objects and a cooperative control device which cooperatively operates said plurality of control devices through a communication line, wherein the vehicle control system further comprises:

a priority assigning device which assigns a priority to the data sent and received via said communication lines;

a plurality of FIFO storage devices which temporarily store said data after being classified depending on said priority; and

a data sending device which sends said data according to its priority from said FIFO storage device which stores said data having high priority.

5. A vehicle control system according to claim 4, wherein, said data sending device which sends data according to its priority stops transmission of said data being sent when the data with an priority that is higher than said data being sent is stored in said FIFO storage device and sends said data having the higher priority.

6. A vehicle control system according to claim 4, further comprises,

a packet generating device that generates packets as said data and a message generating device that partitions said packets into messages depending on the communication protocol; wherein

09991103-112101

505  
B1

5           said priority assigning device assigns said priority depending on the length of  
said packet;

          said plurality of FIFO storage devices classify and temporarily store said  
message depending on said priority of said packets; and

          said data transmission device sends said message according to the priority from  
10   said FIFO storage device that stores said packets assigned said high priority.

7. A vehicle control system comprising a plurality of control devices which forms a  
plurality of subsystems connected to respective controlled objects and a cooperative  
control device which cooperatively operates said plurality of control devices through a  
communication line, wherein the vehicle control system further comprises:

5           said cooperative control device comprises;

          a plurality of different cooperative control side communication ports, ,  
          a data sending and receiving device that carries out transmission and  
receiving of data to and from said plurality of control devices through said cooperative  
control side communication ports, and

10           a determination device that determines whether or not an abnormality has  
occurred in the transmission and receiving of said data; and wherein,

          said plurality of control devices each comprise a plurality of communication  
ports that connect at least two or more among said plurality of cooperative control side  
communication ports; and

15           said data sending and receiving device of said cooperative control device,  
depending on the results of the determination by the determination device, sends and  
receives different said data to and from each of said plurality of communication ports of  
said control devices, and in addition, said data sent to and received from said

09591103-112104  
FOR F. E. F. 6560

communication ports where said abnormality has occurred is sent to and received from  
 20 any said communication ports where said abnormality has not occurred.

8. A vehicle control system comprising a plurality of control devices which forms a plurality of subsystems connected to respective controlled objects and a cooperative control device which cooperatively operates said plurality of control devices through a communication line, wherein the vehicle control system further comprises:

5 a plurality of different cooperative control side communication ports,

a data sending and receiving device that sends and receives data to and from said plurality of control device through said cooperative control side communication ports, and

a determination device that determines whether or not an abnormality has  
 10 occurred in the sending or receiving of said data, and a data partitioning devices that generates a plurality of segments of partitioned data by partitioning said data according to the results of the determination by said determination device; and

said plurality of control devices each comprises a plurality of communication ports that connect at least two or more of said plurality of cooperative control side  
 15 communication ports; and furthermore:

said data sending and receiving device of said cooperative control device sends and receives said different data to and from each of said plurality of communication ports of said control device depending on the result of the determination of said determination apparatus, and in addition, said plurality of partitioned data is sent and  
 20 received by being distributed over said plurality of communication ports on which no abnormality has occurred.

09991103.112104